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6/26
5/21/02

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Jiang et al. : Group Art Unit: 1742

Application No. 09/682,630 : Examiner: A. Wessman

Filed: October 1, 2001 : Response to Paper No. 5

For: **Rhodium, Platinum, Palladium Alloy**

AMENDMENT UNDER 37 CFR 1.111

Assistant Commissioner for Patents
Washington, DC 20231

S I R:

This case has been carefully reviewed in light of the Office Action of 03/27/2002, in which claims 1-4, 10-15, and 20-26 were rejected under 35 USC 103(a) as being unpatentable over Reinacher et al., U.S. Patent No. 3,622,310; and claims 9 and 27-34 were rejected under 35 USC 103(a) as being unpatentable over Reinacher et al. in view of Selman et al., U.S. Patent No. 3,640,705. Claims 1-4, 9-15, and 20-34 remain pending in this application. Reconsideration in light of the following remarks is respectfully requested.

Applicants respectfully traverse the rejection of claims 1-4, 10-15, and 20-26 under 35 USC 103(a) as being unpatentable over Reinacher et al. Reinacher et al. describe alloys of improved strength and high temperature resistance, wherein noble metals such as platinum group metals and gold are combined with small (0.1 to 5 percent) amounts of transition metals whose oxides exhibit high heats of formation, such as zirconium, hafnium, tantalum, and others. This reference describes a process wherein the alloy is heat-treated to oxidize the transition metal to form a dispersion of stable transition metal oxides, which process serves to increase the strength of the noble metal alloy.

In the most recent Office Action, the Examiner argues that Applicants' recitation of "an alloy consisting essentially of rhodium, platinum, and palladium" is insufficient to be patentably distinguished from Reinacher et al., because this transitional phrase "still allows for minor amounts of other elements to be present in the alloy." Applicants respectfully submit that the Examiner's stated interpretation of the transitional language "consisting essentially of" differs in scope from the definition firmly established for this transitional language: "The transitional phrase 'consisting

essentially of' limits the scope of a claim to the specified materials or steps 'and those that do not materially affect the basic and novel characteristic(s)' of the claimed invention." MPEP 2111.03 (emphasis in original).

As the Examiner points out, the alloys of Reinacher et al. can contain as little as 0.1 wt% zirconium (Zr). However, Applicants respectfully submit that in the context of the present application, even 0.1 wt% Zr should not be considered a "minor amount," as such an addition would materially affect the properties of the alloy in reference to an alloy devoid of Zr, especially with respect to the strength and the oxidation resistance of the alloy, two properties disclosed by the present inventors as important in the development of the alloys of the present application (see, for example, the specification, paragraph 0021). For example, Reinacher et al. state "This internal oxidation of alloys of noble metals with addition of relatively small amounts of such metals whose oxides have a high energy of formation has the advantage that it leads...to uniform and fine separations of the oxide in the matrix. A fine separation...is necessary to produce an essentially dispersion hardening effect" (col. 1, lines 33 et seq., emphasis added) with the "relatively small amount" being defined later as 0.1 to 5 percent of Zr or other oxide-forming element. Furthermore, the prior art as provided by the Examiner gives further guidance as to the significant effects of small amounts of Zr and other oxide-forming elements. Of particular relevance is Example 2 of Selman et al., in which a mere 0.05 weight percent zirconium, half of the lower boundary of Reinacher et al., was alloyed with platinum, and Selman et al. report, "internal oxidation (was) seen to occur around the grain boundaries and also within the grain boundaries", and "considerable surface hardening occurred." Selman et al. state "platinum, palladium, and rhodium alloys containing a minor amount of a solute base metal or metals...can be internally oxidized to produce a dispersion-hardened material" (col. 1, lines 38 et seq., emphasis added), and "minor amount" is later defined to be "from a trace to 5 percent by weight" (col. 2, line 9). In fact, as described above, Selman et al. show several examples in which small amounts (i.e., 0.2 weight percent or less) of oxide-forming metal produce significant changes in the oxidation resistance and the strength of the material.

In light of the above, Applicants respectfully submit that even very small amounts of a potent oxide-forming element such as Zr would materially change a noble metal alloy's oxidation and strength-related properties. Although the removal of Zr from a noble metal alloy reduces the alloy's strength somewhat, the advantageous increase in oxidation resistance, coupled with the balance of other properties, as disclosed in the present specification, makes such alloys attractive for use in certain applications. Given this information, Applicants respectfully submit that the transitional language "consisting essentially of," as recited in independent claims is effective to distinguish from Reinacher et al., with its lower limit of Zr of 0.1 wt %. Applicants respectfully submit that claims 1-4, 10-15, and 20-26 are therefore patentably distinct from Reinacher et al.

Applicants respectfully traverse the rejection of claims 9 and 27-34 under 35 USC 103(a) as being unpatentable over Reinacher et al. in view of Selman et al. As described above, Applicants believe that Reinacher et al. does not teach, suggest, or disclose an alloy "consisting essentially of" the elements and their amounts as recited in independent claims 1 (from which claim 9 depends), 27, and

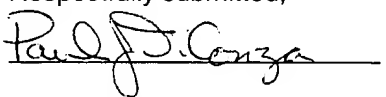
32-34. The combination of Reinacher et al. with Selman et al. does not overcome this deficiency. As described above, Selman et al. show evidence that even very small amounts of zirconium and other oxide-forming elements have a material, significant effect on properties of noble metal alloys, and because both patents require a non-zero amount of Zr to be present in the alloys, the combination of Selman et al. with Reinacher et al. does not teach, suggest, or disclose the embodiments recited in the rejected claims. Furthermore, Applicants respectfully maintain their argument, set forth in the previous Response, that Selman et al. teaches away from the use of an alloy consisting essentially of platinum group metals for use in high temperature applications such as gas turbine components, such as, for in col. 1, lines 15-17. Selman et al. further relate that

> Platinum group metal alloys embodying, or when made by the method of, the invention will be found to possess considerably improved properties at ambient or high temperatures compared with existing platinum group metal alloys, particularly as regards mechanical strength and to be particularly suitable for use not only in the glass industry, as hereinbefore mentioned, but also for certain structural parts of jet engines...*(emphasis added)*

Clearly, alloys "embodying or when made by the invention" according to Selman et al. must have at least one oxide-forming element present. Therefore, Applicants respectfully submit that Selman et al. and its combination with Reinacher et al. do not teach, suggest, or disclose a gas turbine engine component comprising an alloy consisting essentially of platinum group metals, as recited in independent claims 27 and 32-34, and thus these claims are patentably distinct from the applied references, whether singly or in combination. Furthermore, claim 9 depends from claim 1 (not included in this specific rejection), and claims 28-31 depend from claim 27, and thus Applicants respectfully submit that each of these dependent claims is patentably distinct from the applied reference because each depends from a distinct independent claim.

In view of the foregoing, Applicants respectfully submit that the application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are respectfully requested.

Respectfully submitted,



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